

Claims

1. Method for protection switching and monitoring in a data transmission system, in which a working multiplex signal (STM-N_w) is transmitted over a working connection (WV) and a protection multiplex signal (STM-N_p) over a protection connection (PV) between network elements (NE1, NE2) and on the receive side multiplex signal protection switching between these multiplex signals (STM-N_w, STM-N_p) and/or a path protection switching between path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN) is undertaken as well as performance monitoring of the selected path signals, characterized in that,

the working multiplex signal (STM-N_w) is divided into working path signals (VC-4W1 - VC-4WN) and the protection multiplex signal (STM-N_p) into protection path signals (VC-4P1 - VC-4PN), the working path signals (VC-4W1 - VC-4WN) and the protection path signals (VC-4P1 - VC-4PN) are routed to only one switching device (11) both for multiplex signal protection switching as also for path protection switching, the multiplex signal protection switching is undertaken by switching all path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN),

the performance monitoring of the working path signals (VC-4W1) and of the protection path signals (VC-4P1) is undertaken before the switching device (11) and performance values (FW, FP) of the working path signals (VC-4W1) or of the associated protection path signals (VC-4P1) in each case are accumulated and at the end (t₃) of a monitoring period a resulting performance value (PW) is determined.

2. Method in accordance with claim 1, characterized in that performance monitoring is undertaken for a working path signal

(VC-4W1) in a working performance monitoring device (8) and for the corresponding protection path signal (VC-4P1) in a separate protection performance monitoring device (9).

3. Method in accordance with claim 1 or 2, characterized in that a number of protection connections (PV, PPV) are checked.

4. Method in accordance with claim 1 or 2, characterized in that only specific parts of the multiplex signals (STM-N_w, STMN_p) or of the path signals (VC-4W, VC-4P) of lower granularity are checked.

5. Method for protection switching and monitoring in a data transmission system, in which a working multiplex signal (STM-NW) is transmitted over a working connection (WV) and a protection multiplex signal (STM-N_p) over a protection connection (PV) between network elements (NE1, NE2) and on the receive side a multiplex signal protection switching between these multiplex signals (STM-N_w, STM-N_p) and/or path protection switching between path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN) as well as alarm monitoring of the selected path signals is undertaken,

characterized in that

the working multiplex signal (STM-N_w) is divided up into working path signals (VC-4W1 - VC-4WN) and the protection multiplex signal (STM-N_p) into protection path signals (VC-4P1 - VC-4PN),

the working path signals (VC-4W1 - VC-4WN) and the protection path signals (VC-4P1 - VC-4PN) are routed to only one switching device (11) both for multiplex signal protection switching and also for path protection switching,

the multiplex signal protection switching is undertaken by switching all path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN),

alarm monitoring (f3, f4) of the working path signals ((VC-4W1) and the associated protection path signals (VC-4P1) is undertaken and the alarm criteria (ASW, ASP) of the signal selected in each case (VC-4W1 or VC-4P1) are passed on.

6. Method in accordance with claim 6, characterized in that after protection switching the alarm-criterion (ASW, ASP) of the newly selected working path signal (VC-4W1) or protection path signal (VC-4P1) is only changed after a checking time has elapsed.

7. Arrangement for protection switching and monitoring in a data transmission system, in which a working multiplex signal (STM-N_w) is transmitted over a working-connection (WV) and/or a protection multiplex signal (STM-N_p) over a protection connection (PV) between network elements (NE1, NE2) and on the receive side a protection circuit between these multiplex signals or path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN) contained within them as well as performance monitoring of the selected path signals is undertaken.

characterized in that

only one switching device (11) is provided to which the working path signals (VC-4W1 - VC-4WN) are routed over working path lines (WL1 - WL4) and the protection path signals (VC-4P1 - VC-4PN) over protection path lines (PL1 - PL4), with the multiplex signal protection switching being undertaken by switching all path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN), a working performance monitoring device (8) and each of the protection path lines (PL1) a protection performance monitoring device (9) is connected to each of the working path lines (WL1) and an accumulation device (10) is connected to the alarm monitoring devices (8, 9) which determines the resulting performance values (PW).

8. Arrangement for protection switching and monitoring in a data transmission system, in which a working multiplex signal (STM-N_w) is transmitted over a working-connection (WV) and/or a protection multiplex signal (STM-NP) over a protection connection (PV) between network elements (NE1, NE2) and on the receive side a protection circuit between these multiplex signals or path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN) contained within them as well as performance monitoring of the selected path signals is undertaken.

characterized in that

only one switching device (11) is provided to which the working path signals (VC-4W1 - VC-4WN) are routed over working path lines (WL1 - WL4) and the protection path signals (VC-4P1 - VC-4PN) over protection path lines (PL1 - PL4), with the multiplex signal protection switching being undertaken by switching all path signals (VC-4W1 - VC-4WN; VC-4P1 - VC-4PN), a working alarm monitoring device (5) is connected to each of the working path lines (WL1) and a protection alarm monitoring device (6) is connected to each of the protection path lines (PL1),

the working alarm signal (ASW) is routed from a working alarm monitoring device (5) and the protection alarm signal (ASP) from an associated protection alarm-monitoring device (6) is routed to an alarm switching device (7) in each case.

an alarm control (4), to which a protection switching signal (PSW) is routed, through connects the alarm signal (ASW, ASP) of the newly selected path signal (VC-4W1 or VC-4P1) via the alarm switching device (7) only after a checking time has elapsed.